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<p>(21) International Application Number: PCT/US99/07261</p> <p>(22) International Filing Date: 2 April 1999 (02.04.99)</p> <p>(71) Applicant (for all designated States except US): EPAR, LLC [US/US]; 3400 East Race Avenue, Searcy, AR 72143 (US).</p> <p>(72) Inventor; and</p> <p>(75) Inventor/Applicant (for US only): WILBANKS, Alvin, D. [US/US]; 3519 West County Road, #668, Osceola, AR 72370 (US).</p> <p>(74) Agents: DELUCA, Vincent, M. et al.; Rothwell, Figg, Ernst & Kurz, Suite 701 East, Columbia Square, 555 13th Street N.W., Washington, DC 20004 (US).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p>
<p>(54) Title: INSECT TRAP</p> <p>(57) Abstract</p> <p>An apparatus and method for controlling flying pest-type insects such as mosquitoes and flies. An insect trap (10) according to the invention includes a darkened chamber (18) into which insects are naturally drawn, with insect-ensnaring interior surfaces such as glue panels (20). One or more additional insect attractants beyond the darkened nature of the chamber may also be provided to enhance the effectiveness of the trap.</p> <div data-bbox="917 1113 1388 1669"> </div>		

INSECT TRAP**BACKGROUND AND FIELD OF THE INVENTION**

The invention relates to an apparatus and method for controlling insect pests such as mosquitoes, flies, and the like. Mosquitoes, flies, and other flying insects have been the source of disease, as well as simply a nuisance, for many, many years. Accordingly, many different devices have been developed over the years to combat these pests. It is Applicant's belief, however, that all previously known pest control devices have focused on trapping and killing flying pests on an individual basis, i.e., as each individual insect encounters the trapping device. A problem with this approach, however, is that flying pests typically are like other pests such as cockroaches -- if one is seen (and trapped/killed), there are usually many more in the area that are not able to be seen and/or trapped/killed. Accordingly, an apparatus and method which traps and kills flying pests on an *en masse* basis is needed.

SUMMARY OF THE INVENTION

The apparatus and method of the present invention satisfies this need. The invention does so by means of an insect trap that presents itself as a nesting or roosting location for the insects, thereby attracting and killing the insects on an entire swarm or generational basis.

To this end, in one aspect, the invention features an insect trap having a body which defines a chamber. The chamber is open to the atmosphere and the body is configured and can be positioned such that the chamber remains generally darkened even
5 when the body is disposed in an area that is illuminated, such as outdoors. The generally darkened nature of the chamber attracts insects to nest or roost in the chamber on an *en masse* basis. An insect-ensnaring surface is located within the chamber to trap and kill the insects.

Preferred embodiments of an apparatus according to the invention may have one or more of the following features. The trap may include one or more insect attractants besides the darkened nature of the chamber, such as a moisture reservoir. The moisture reservoir may be provided by a water trough,
15 possibly with a circulation system that trickles water along outer surfaces of the insect trap, or the moisture reservoir could be one or more wicks disposed within the chamber and absorbing moisture such as rainwater or dew. Alternatively, the additional attractant could be a chemical attractant such as
20 pheromones coated, for example, on the walls of the chamber.

In another aspect, the invention features a method of trapping insects. According to the method, a chamber that is open to the atmosphere is disposed in an area to be protected, and the chamber is configured and disposed so as to remain
25 generally darkened even when the area to be protected is illuminated. Insects are naturally attracted by the darkened nature of the chamber and will nest or roost in the chamber,

where they are ensnared by insect-ensnaring surfaces of the chamber.

Thus, with the apparatus and method of the invention, pesky insects can be trapped and killed on a large-scale, highly efficient basis, rather than on a one-bug-at-a-time basis.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in greater detail in connection with the drawings in which:

Fig. 1 is a perspective view of an embodiment of an insect trap according to one aspect of the invention, with part of the trap broken away;

Fig. 2 is a sectional elevation view of an embodiment of the invention that is similar to the embodiment shown in Fig. 1, but demonstrating additional features of the invention;

Figs. 3a and 3b are perspective views showing an alternative configuration of an insect trap according to the invention and demonstrating alternative mounting configurations.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

A first embodiment 10 of an insect trap according to the invention is shown in Fig. 1. This embodiment is constructed as an open-ended cylinder, with a cylindrical wall 12 having an open bottom end 14 and a cap 16. The cylindrical wall 12 and cap 16 are made from material such as aluminum or heavy, plastic-coated paper which is generally opaque. The construction is such that the insect trap defines a hollow

chamber 18 therein. The dimensions of the insect trap are such that, in combination with the opaque nature of the material from which the cylindrical wall 12 and cap 16 are constructed, the hollow chamber 18 is relatively darkened when the insect trap 10 is oriented with the open end 14 at the bottom, as shown.

One or more glue panels 20 are attached to the inside surface of the cylindrical wall 12. The glue panels 20 may be of any sort commonly available that are used to trap flying insects. It is contemplated that the insect trap can be constructed such that the glue panels can be replaced when they are used up, i.e., when they are totally covered with trapped insects. This may be accomplished by attaching the glue panels to the inside surfaces of the cylindrical wall by releasable means such as hook and loop fasteners (not shown).

Alternatively, if desired, the entire cylindrical wall 12 can be made from disposable materials such as heavy stock paper that is coated on the inner surfaces with insect-trapping adhesive material, and the entire unit can be thrown away when it is completely covered on the inside with trapped insects.

Finally, with respect to the basic construction illustrated in Fig. 1, the insect trap 10 has a pair of mounting slots 22 which permit the insect trap to be mounted to a wall, post, or other vertical surface by being hung, e.g., on a pair of nails or screws the heads of which are not entirely flush with the surface to which the insect trap is being attached.

Additional features and aspects of an insect trap according to the invention are shown in Fig. 2, in which like reference

numerals are used to denote structure that is the same as in the embodiment shown in Fig. 1. In addition to the basic structure, the embodiment 30 shown in Fig. 2 features insect attractants in addition to the generally darkened nature of the chamber. In particular, it includes a water trough 26 which encircles the lower portion of the insect trap 30. A small, submersible water pump 32, e.g., of the sort used in aquariums, is located within the water trough 26 and pumps water via riser 34 to a water line 36, which encircles the upper portion of the insect trap 30. The water line 36 has perforations (not shown) in its bottom edge and extending along the entire circumference of the water line such that water trickles down the outside surface of the unit and back to the water trough 26. This moisture -- both the standing water in the trough and the moisture trickling down the surface of the unit -- is a strong attractant for insects, particularly mosquitoes, and many types of insects will lay their eggs in the standing water. The pump 32 used to circulate the water may be powered by alternating current (household supply), direct current (battery), or solar cell when the unit is located outside.

The embodiment 30 shown in Fig. 2 also has one or more wicks 38, e.g. a pair, which hang down inside the chamber defined by the unit. The wicks absorb rain and dew, and this moisture (in the wicks) inside the chamber helps attract insects into the darkened chamber. The wicks can be secured in position quite simply by tying knots 40 in their ends and inserting them through holes in the cap 16 such they dangle inside the chamber

of the unit. Preferably, the wicks may also be saturated with any of numerous insect attractants, e.g., pheromones used in the agricultural industry to target crop-destroying insects. The same attractants as used in the wicks, or others, can also be
5 sprayed on the inner surface of the cylindrical wall 12, as indicated by the stippling shown in Fig. 2.

The size and configuration of an insect trap according to the invention is unlimited, but it must have a hollow, generally darkened chamber which will attract mosquitoes or other pest
1 insects to nest and/or roost therein. For example, an insect trap according to the invention could be tent-shaped, as in the embodiment 50 shown in Fig. 3a, and this embodiment can be mounted to a wall 52 with the open end 54 oriented either down as shown in Fig. 3a or up as shown in Fig. 3b, so long as the
15 chamber remains darkened.

An insect trap according to the invention is simply hung on a vertical surface such as a wall (either indoors or outdoors) or a tree, preferably near an area of shrubbery when used outdoors. Flying insects such as mosquitoes or flies 56 (Fig.
20 3a) will naturally be attracted to the darkened cavity of an insect trap according to the invention, where they will roost and/or nest. This attraction will be enhanced if the various attractants described above are used. In this manner, because the insects will attempt to nest in the insect trap, whole
25 populations of insects can be eradicated in one fell swoop, either as the insects enter the trap to nest and get stuck on

the glue panels or as newly hatched juvenile insects resulting from successful nesting move about within the insect trap.

It will be appreciated that numerous other designs and configurations can be developed that are within the scope and spirit of the invention, and such further embodiments are deemed to be within the scope of the following claims.

I claim:

- 1 1. An insect trap, comprising:
2 a body defining a chamber that is open to the atmosphere,
3 said body configured and positionable such that said chamber
4 remains generally darkened even when said body is disposed in an
5 area of illumination; and
6 an insect-ensnaring surface disposed within said chamber.
- 1 2. The insect trap of claim 1, further comprising one or
more insect attractants additional to the darkened nature of
3 said chamber.
- 1 3. The insect trap of claim 2, wherein one of said one or
2 more insect attractants comprises a moisture reservoir.
- 1 4. The insect trap of claim 3, wherein said moisture
2 reservoir comprises a water trough.
- 1 5. The insect trap of claim 4, further comprising a water
2 circulation system which trickles water along outer surfaces of
3 said body.
- 1 6. The insect trap of claim 3, wherein said moisture
2 reservoir comprises one or more wicks disposed within said
3 chamber.
- 1 7. The insect trap of claim 6, wherein said wick or wicks
2 extend outside of said chamber so as to absorb moisture.

1 8. The insect trap of claim 2, wherein one of said one or
2 more insect attractants comprises a chemical insect attractant.

1 9. The insect trap of claim 8, wherein said chemical
2 insect attractant comprises one or more pheromones.

1 10. The insect trap of claim 8, wherein said chemical
2 insect attractant is coated over inner surface walls of said
chamber.

1 11. The insect trap of claim 1, wherein said insect-
2 ensnaring surface is removably affixed within said chamber and
3 is replaceable.

1 12. An insect trap, comprising
2 a body defining a chamber that is open to the atmosphere;
3 an insect-ensnaring surface disposed within said chamber;
and
5 an insect attractant comprising a moisture reservoir.

1 13. The insect trap of claim 12, wherein said moisture
2 reservoir comprises at least one wick disposed within said
3 chamber.

1 14. The insect trap of claim 12, wherein said moisture
2 reservoir comprises a water trough.

1 15. The insect trap of claim 14, further comprising a
2 water circulation system which trickles water along outer
3 surfaces of said body.

1 16. A method of trapping insects, comprising:
2 disposing a chamber that is open to the atmosphere in an
3 area to be protected, said chamber being configured and disposed
4 so as to remain generally darkened even when said area to be
protected is illuminated;

6 permitting insects to enter said chamber, said insects
7 being attracted by the generally darkened nature of said
8 chamber; and

9 ensnaring said insects on insect-ensnaring surfaces of said
10 chamber.

1 17. The method of claim 16, further comprising providing
2 an insect attractant additional to the generally darkened nature
of said chamber.

1 18. The method of claim 17, wherein providing said insect
2 attractant additional to the generally darkened nature of the
3 chamber comprises circulating water in the vicinity of said
4 chamber.

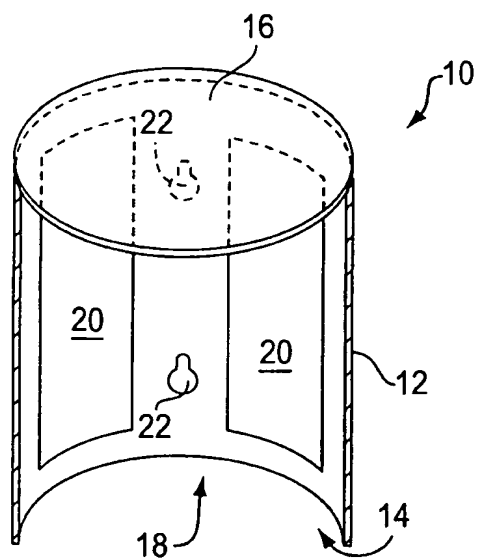


FIG. 1

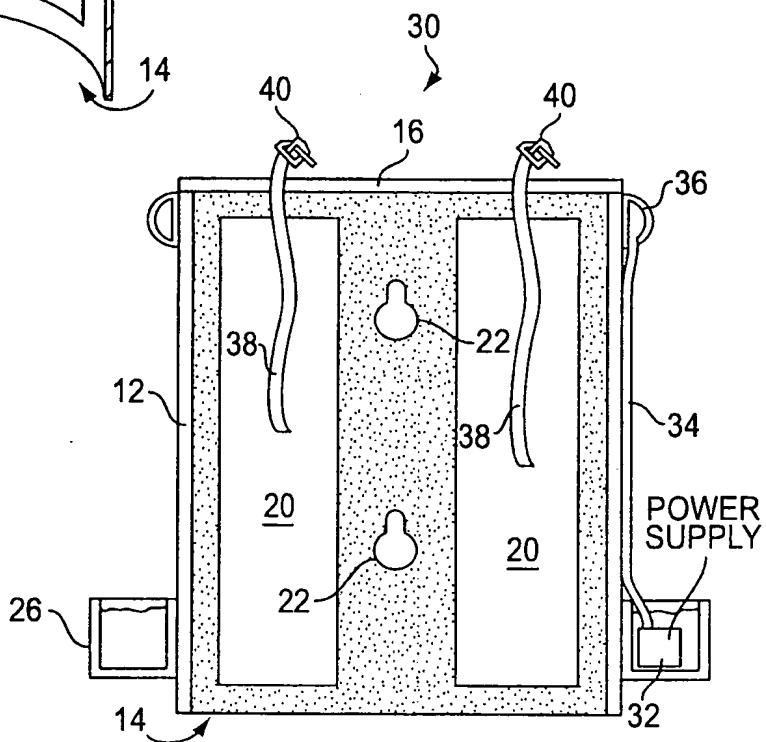


FIG. 2

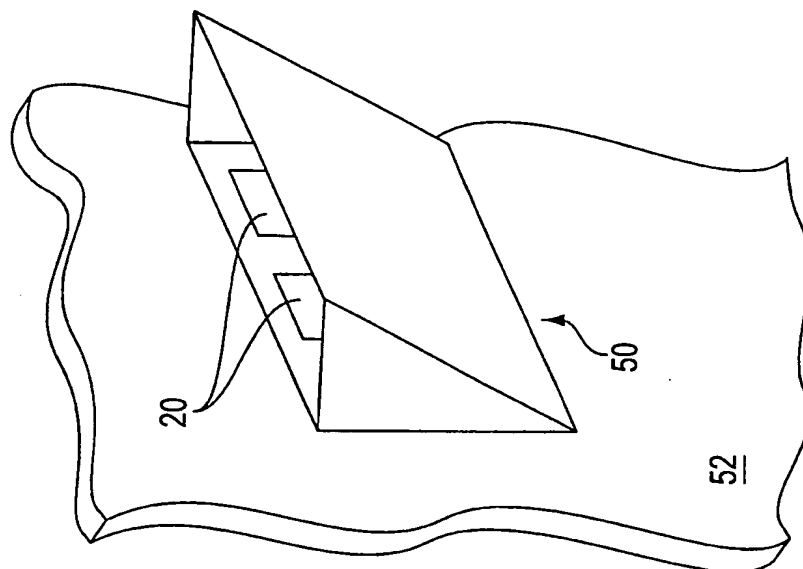


FIG. 3b

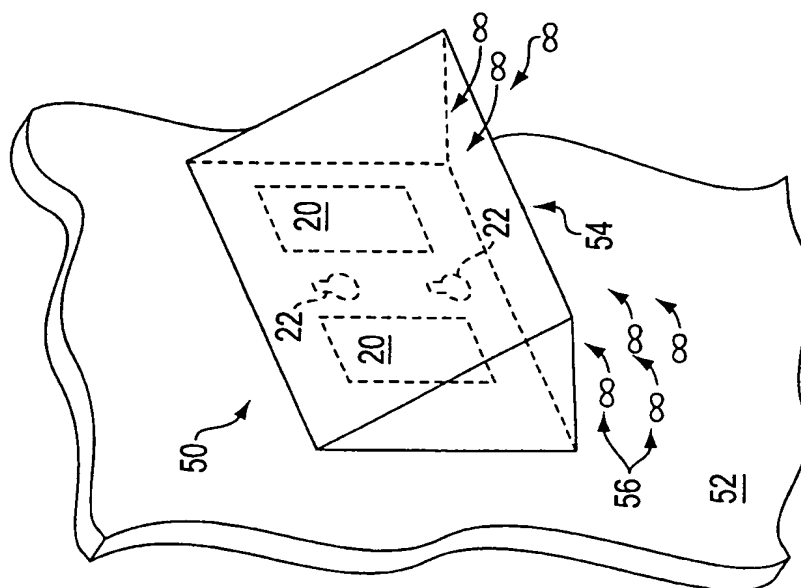


FIG. 3a